Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Patterning of Ferritin Nanoparticles on Gold Posts of Silicon Substrate[1] YUNXIA HU, DIAN CHEN, SOOJIN PARK, TODD EMRICK, THOMAS RUSSELL, Dept. of Polymer Science and Engineering, University of Massachusetts Amherst, HITACHI COLLABORATION — Patterning and immobilizing protein nanoparticles with nanometer-scale control has been proven integral to a range of applications in the development of biochip arrays, biosensor and electronic devices. Protein nanoparticles, such as ferritin nanoparticles, have a uniform size distribution and shape that can be used to construct well-defined patterns with nanoscale features. Here, the gold posts on silicon were produced using block copolymer PS (47.6 kg/mol)-b-P4VP (20.9 kg/mol) (PDI: 1.14) as a template and then gold chloride solution was loaded into P4VP domain. After reducing gold salt into gold and removing the block copolymer using anoxygen plasma, producing a pattern of gold posts. Thiol modified horse spleen ferritin are anchored to gold posts of silicon substrate by the binding of thiol and gold. Scanning electron microscopy (SEM) shows that the feature size of gold posts decreased from 30 nm to 13 nm after attached with modified ferritin nanoparticles, which is consistent with size of modified ferritin. Also XPS result shows nitrogen and ion elements on ferritin-attached gold posts, and the signal of gold was attenuated after ferritin attached.

[1]This work was supported by MURI, DOE,and MRSEC.

Yunxia Hu
Dept. of Polymer Science and Engineering,
University of Massachusetts Amherst

Date submitted: 10 Dec 2008 Electronic form version 1.4